SCOPE OF WORK
for
High Pressure Remote Operated Ball Valves
(Test Stand 2A--Air Force Research Lab)
Revision 0, January 18, 2002

SCOPE:

The scope of work includes designing, fabricating, testing, and delivering two (2) high pressure (6000 psig) hydraulic and pneumatically actuated ball valves for hydrocarbon fuel service. The valves are listed by tag number as follows:

- **ROV-4001**

- **ROV-4002**

DOCUMENTS:

The above scope is supported by the following documents which form the technical basis for the bid package:

Specification No. AES-1005 "Specification for High Pressure Remote Operated Ball Valves", and accompanying two technical data sheets, one technical data sheet for each valve.

Note: Specification AES-1005 calls for soft seated ball valves. For the two valves contained in this Scope of Work, the Contractor may propose the use of metal seated ball valves. All other requirements of the specification apply.

SCHEDULE: (all durations are after award of contract)

Initial submittal of engineering drawings for valves	45 days
Delivery of two carbon steel remote operated ball valves	120 days
Receipt of all other reports and documentation (delivered to AFRL) after shipment of the valves	7 days

All other submittals (such as welding procedures, cleaning procedures, and similar documentation called out in the contract) shall be submitted to the Contracting Officer for review and approval at least two weeks in advance of when the Contractor plans to use the procedure.

The scheduled delivery date is important. The Contracting Officer will expect the Contractor to deliver the valves within the stated time. If the schedule dates indicated are not feasible, then the Contractor shall include tenable schedule durations for each valve in his proposal.

MEETINGS:

An initial kick-off meeting will be held at the Contractor's facilities to review the technical requirements, scope of work, and schedule within 10 days after award of contract.

At a minimum the Contracting Officer will inspect the valves prior to cleaning and shipment to AFRL. The Contractor will notify the Contracting Officer at least 10 days in advance of when he is ready for final inspection.

The Contractor Officer, may at his discretion, make other interim inspections, which may include, but not be limited to, witnessing in-process welding and fabrication of the valves, various testing, and final assembly of the valves. The Contracting Officer may also take photographs (still and video) of work in progress on the subject valves at the Contractor's facilities.

PROPOSAL

The Contractor shall provide a price for each valve that includes all design, engineering, materials, fabrication, testing, inspection, transportation, or any other costs associated with the valve.

OTHER

The Contractor shall provide a point of contact who is knowledgeable about the current design, material procurement, fabrication, and testing status for each valve. The Contracting Officer will frequently contact this individual to obtain status and assure himself that the completion date for the valves is on schedule, and technical requirements are met.

At the kick-off meeting identified above the Contractor shall prepare and have available for review and discussion a detailed schedule indicating the following activities for each valve: Engineering, Procure Materials (including separate line items for valve bodies, flanges, actuators, softgoods and trim), Fabrication, Assembly and Testing, Cleaning and Shipment to the AFRL.

ROSS

♦♦♦♦CONTROL AND REMOTE OPERATED VALVES♦♦♦♦

Customer:	United States Air Force Research Laboratory		Date: 2-5-01
Project:	Test Stand 2A		Rev: 0
			By: HJW/DJV
TAG NO.	**ROV-4001**	Drawing No. P&ID 47	
Description:	Hydrocarbon Main Run Line ROV		

♦♦♦♦GENERAL♦♦♦♦

Manufacturer:		Model and Type:	**Ball**
Balanced Valve:		MIL-STD-1246C Cleanliness Level:	300

♦♦♦♦BODY AND TRIM♦♦♦♦

Nominal Body Size (IN):	8	Body Rating (PSIG)	6000
Face-to-Face Dimension (IN):	36	Inlet Pipe Spec.:	C6K-A
End Connections: Reflange Inlet F120082EC Outlet XF08-1.320 G62ECA1		Outlet Pipe Spec:	C6K-A
Body Material:	A105 (2)	Ball and Softgood Materials:	By Manufacturer
Seal Leak Class:	V	Bonnet Type:	NA

♦♦♦♦ACTUATOR♦♦♦♦

Hydraulic/Pneumatic (H/P):	H	Manufacturer:	
Servo (GPM):		Model:	
Frequency Response (Hz):		Actuation Pressure (PSIG):	3000
Open Stroke Time (MSEC):	2000	Close Stroke Time (MSEC):	1500
Flow Action to (OPEN/CLOSE):	NA	Sizing Dp (PSI):	6000 (3)
Spring (Y/N): Y	Mode: CLOSE	Failure Mode (Electrical):	Close
Positioner:		Internal Filter/Moisture Separator (Y/N):	Y
Declutchable Manual Handwheel (Y/N):	N	Manual Hydraulic Mode Hand Pump:	N
Position Indicator: Y+Open/Close Limit Switches			

♦♦♦♦FLUID DATA♦♦♦♦

Fluid:	Hydrocarbon Fuel (RP-1 & others)	Molecular Weight:	Varies
Min./Max. Temp. (°F):	-20 to 150°	Critical Pressure (PSIA):	NA

CONDITION

Flow:	1300 lbm/sec	Density:	50.3 lbm/ft^3
Inlet Pressure (PSIA):	6000	Outlet Pressure (PSIA):	5900
Viscosity:		Vapor Pressure:	
Required Cv Fl at Lift:		Estimated SL (dBA):	
Required Trim:		Selected 100% Travel Cv:	1100
Keep Cv Within:	+10% to -10%	Desired Minimum Cv Turndown:	NA

(1) Note: Solenoid valve(s) shall be provided on the valve manifolding to ensure the valve fails in the designated electrical failure mode position

(2) Note: Manufacturer may propose substitute carbon steel materials for fabrication of the valve

(3) Note: Valve shall be capable of opening with a DP of 500psi and closing with full DP of 6000psi. Actuator shall not be capable of opening the valve when pressure on inlet side is • 1000 psi

ROSS

♦♦♦♦CONTROL AND REMOTE OPERATED VALVES♦♦♦♦

Customer:	United States Air Force Research Laboratory		Date: 2-5-01
Project:	Test Stand 2A		Rev: 0
			By: HJW/DJV
TAG NO.	**ROV-4002**	Drawing No. P&ID 47	
Description:	Hydrocarbon Fill Line ROV		

♦♦♦♦GENERAL♦♦♦♦

Manufacturer:		Model and Type:	**Ball**
Balanced Valve:		MIL-STD-1246C Cleanliness Level:	300

♦♦♦♦BODY AND TRIM♦♦♦♦

Nominal Body Size (IN):	2	Body Rating (PSIG)	6000
Face-to-Face Dimension (IN):	By Vendor	Inlet Pipe Spec.:	C6K-A
End Connections:	Reflange F02XXG14ECA1	Outlet Pipe Spec:	C6K-A
Body Material:	A105 (2)	Ball and Softgood Materials:	By Manufacturer
Seal Leak Class:	V	Bonnet Type:	NA

♦♦♦♦ACTUATOR♦♦♦♦

Hydraulic/Pneumatic (H/P):	P	Manufacturer:	
Servo (GPM):		Model:	
Frequency Response (Hz):		Actuation Pressure (PSIG):	150
Open Stroke Time (MSEC):	2000	Close Stroke Time (MSEC):	2000
Flow Action to (OPEN/CLOSE):	NA	Sizing Dp (PSI):	(3)
Spring (Y/N): Y	Mode: CLOSE	Failure Mode (Electrical):	Close
Positioner:		Internal Filter/Moisture Separator (Y/N):	Y
Declutchable Manual Handwheel (Y/N):	N	Manual Hydraulic Mode Hand Pump:	N
Position Indicator: Y+Open/Close Limit Switches			

♦♦♦♦FLUID DATA♦♦♦♦

Fluid:	Hydrocarbon Fuel	Molecular Weight:	2.016
Min./Max. Temp. (°F):	-20 to 150°	Critical Pressure (PSIA):	

CONDITION

Flow:	15 lbm/sec	Density:	50.3 lbm/ft^3
Inlet Pressure (PSIA):	25	Outlet Pressure (PSIA):	20
Viscosity:		Vapor Pressure:	
Required Cv Fl at Lift:		Estimated SL (dBA):	
Required Trim:		Selected 100% Travel Cv:	171
Keep Cv Within:	NA	Desired Minimum Cv Turndown:	NA

(1) Note: Solenoid valve(s) shall be provided on the valve manifolding to ensure the valve fails in the designated electrical failure mode position

(2) Note: Manufacturer may propose substitute carbon steel materials for fabrication of the valve

(3) This valve will be normally used for low pressure fill of a fuel system. However, during operation of the system the outlet side of the valve will be subjected to pressures up to 6000 psi. The valve actuator shall not be capable of opening valve with outlet pressure greater than 1000 psi. Opening/Closing DP 150 psi maximum.